

The National Geographic Magazine

AN ILLUSTRATED MONTHLY



Honorary Editor JOHN HYDE

Honorary Associate Editors

A. W. ORELLY W. J. MCDEE HENRY GAMMOTT
G. HANT MERRIAM ELTON HUNTER SCOMORE

CONTENTS

| | PAGE |
|--|-------------------------|
| A SUMMER VOYAGE TO THE ARCTIC. With map and illustrations. | GEORGE K. PUTNAM / 97 |
| THE AREA AND ORIGIN OF LAKES SUPERIOR. | MARK W. HAWKINS / 111 |
| THE BIRKINIAN TRANSCONTINENTAL RAILROAD. | GEN. A. W. ORELLY / 111 |
| GEOGRAPHIC LITERATURE / 124 GEOGRAPHIC SERIALS / 127 PROCEEDINGS OF THE NATIONAL GEOGRAPHIC SOCIETY / 128 | |

NOTES

EDITED BY THE NATIONAL GEOGRAPHIC SOCIETY

Address to the Chairmen of Committees

The American News Company, 23rd & 4th Avenue, New York.

Price 25 Cents. \$2.50 a Year.

THE National Geographic Society

ORGANIZED JANUARY, 1888

President

GARDNER C. HUBBARD

Vice-Presidents

MALCOLM BAILEY

C. W. GREENLY

WILLIAM H. DALL

C. HENRY MERRIAM

W. K. CLARK

HERBERT G. OLDFIELD

Treasurer

CHARLES J. HILL

RECORDED, NEW YORK

Corresponding Members

EDWARD PAYEN

HENRY GASKETT

Members

H. P. BLONDT

W. J. MACFEE

C. W. DABNEY, Jr.

F. H. NEWELL

DAVID T. DAY

W. H. POWELL

JOHN HYDE

J. R. WIGG

SECRETARY'S OFFICE, 1517 H STREET N. W., WASHINGTON

The National Geographic Society, the object of which is the increase and diffusion of geographical knowledge, has a paying membership of 1,000. Its membership is not restricted to professional geographers, but is open to any person in good standing who cannot sufficiently independent in his work to work independently. The annual subscription is for active members, \$1.00 per annum; for corresponding members, \$2.00 per annum. Active members may take the entire box of publications. The Secretary, Corresponding Members, is paid regularly to all countries, both active and corresponding.

Contributions for the founding of Prize Medals and Scholarships are respectfully solicited.

MAP OF THE KOOTENAI

GHIE most complete map of the rich mining region of the Kootenai and adjacent territory in Washington and British Columbia has just been published by the

NORTHERN PACIFIC RAILWAY.

It is just what is needed by those going to that country or who desire to study and know about it.

The map is made in relief, is 25 by 18 inches in size between borders, and has in connection with it—on the same page—smaller maps that show the relation of the region to the world at large.



SHELTER, TRAIL, B.C.

The principal drainage of the country is laid down in blue, the trails and roads are shown, the railways plainly indicated, the names of important towns printed in large black letters, and the topography is represented in brown. As far as the ore deposits are known, they are indicated in a general way by red lettering.

The country shown upon the map includes particularly the Slocan, Kootenai Lake, Cariboo Creek, Deer Park, Nelson, Salmon River, Trail or Rossland, and the Boundary Creek regions. It also shows the Arrow Lakes and Larderum country and some portion of the Okanagan and Fort Steele regions.

The map is compiled from reliable and official data and shows the Mining District Subdivisions and the elevations of the mountains and lakes.

The opposite side of the sheet contains an accurate statement and description of the country, showing its discovery and development to the present time. The folder will be sent to any address, together with a copy of

WONDERLAND '97.

our new tourist book, upon receipt of six cents in stamps.

CHAS. S. FEE,
General Passenger Agent, St. Paul, Minn.



* * * * * SOUTHERN SYSTEM.

Penetrates with its main line or branches eight States south of the Ohio and Mississippi Rivers, and in conjunction with its friendly allied connections reaches all the commercial centers of the South and Southwest.

DOUBLE DAILY VESTIBULED LIMITED TRAINS

. BETWEEN

Washington and Nashville via Salisbury, Asheville, Knoxville and Chattanooga.

Washington and Tampa via Columbia, Savannah and Jacksonville, Washington and Memphis via Atlanta, Birmingham and St. Louis, Washington and New Orleans via Atlanta, Montgomery and Mobile, Norfolk and Chattanooga via Salisbury, Asheville and Knoxville.

Pullman Sleeping Cars—Dining Cars—Day Coaches.
Additional Trains for local travelers

The direct line to the FLORIDA, GULF COAST and TEXAS,
Winter Resorts of MEXICO and CALIFORNIA,

—AND THE BEST—

Through Car Line to and from Asheville and Hot Springs—“The Land of the Sky.”

Write for Map Folders.

R. D. CARPENTER, General Agent, 321 Broadway, New York City.
L. S. BROWN, General Agent Passenger Department, Washington, D. C.
J. H. WINGFIELD, Passenger Agent, New York, N. Y.

E. H. HARDWICK, Assistant General Passenger Agent, Atlanta, Ga.
C. A. BISCOOTER, Assistant General Passenger Agent, Chattanooga, Tenn.
W. R. TAYLOR, Assistant General Passenger Agent, Louisville, Ky.
J. M. CULP, Traffic Manager

W. A. TURN, General Passenger Agent

FLORIDA

THE SHORTEST,
QUICKEST,
MOST ATTRACTIVE
ROUTE

IS BY THE LINES OPERATED OVER THE

Florida Central & Peninsular R. R.

THE FLORIDA CENTRAL AND PENINSULAR RAILROAD begins on the north at Columbia, runs through Savannah, Jacksonville, Okala, Tampa, Fernandina, Gainesville, Orlando, and Tallahassee.

It is the direct route to Lake for St. Augustine, Lake Worth, and all East Coast points; for Miami, Key West, and Nassau; also for points on the Gulf of Mexico and Havana and for all the principal interior points in Florida. These trains daily from New York during the tourist season, passing through Philadelphia, Baltimore, and Washington.

One of the best trains in the country is the NEW YORK AND FLORIDA LIMITED, with Compartiment Cars, Pullman Sleepers, Observation cars, Dining Cars, and Passenger Coaches. This train leaves New York at 14.15 P.M. and arrives at Jacksonville at 2.30 p. m. next day, St. Augustine at 4.30 p. m.

The CINCINNATI AND FLORIDA LIMITED, another very elegant vestibuled train, makes the run in about 34 hours between Cincinnati and Jacksonville, via Chattanooga, Atlanta, Macon, and Albany.

The ASHEVILLE ROUTE is the scenic route over the Carolina mountains between Cincinnati and Jacksonville, via Knoxville, the Mountain Resorts, Columbia, and Spartan.

The KANSAS CITY THROUGHS TRAIN is by this road, via Fort Scott, Memphis, Holly Springs, Birmingham, Atlanta, and Albany.

The NEW ORLEANS THROUGHSLEEPER runs from New Orleans by Panama on this route and via the beautiful Middle Florida Country.

Remember that the FLORIDA CENTRAL AND PENINSULAR does not only go to Jacksonville, but connects generally by these connections all over the state.

Get THE NEW INDEXED MAP OF FLORIDA from any of our agents or from the General Passenger Agent.

J. C. ADAMS, Genl. Eastern Agt.,
321 Broadway, New York.

W. H. PENNINGTON, Genl. Western Agt.,
417 Walnut Street, Cincinnati, O.

WALTER G. COLEMAN, Genl. Tex. Agt., 103 Broadway, New York.

N. A. PENNINGTON, Traffic Manager,

A. D. MACKENZIE, Genl. Tex. Agt.,

Jacksonville, Fla.

F
L
O
R
I
D
A

The Great Hotels
OF THE

East Coast

AT
ST. AUGUSTINE,
ORION,
PALM BEACH
AND
MIAMI.

Railway.

For map of Florida and book Florida from Coast, address—

J. P. PARROTT, J. P. McCAWTHIN, J. D. RAMSEY,
President, Traffic Manager, and General Sales Agent,
St. Augustine, Fla.

KEY WEST AND MIAMI
. . . STEAMSHIP CO.

THE BEAUTIFUL ROUTE TO

KEY WEST.

Ten Hours from Miami along the Florida Keys in daylight.

See local time card for sailing dates.

MIAMI AND NASSAU
STEAMSHIP SERVICE

BETWEEN

Miami and Nassau, N. P.
(Bahama Islands).

Will be inaugurated about JANUARY 15th
for the WINTER TOURIST SEASON
or 1897.

See advertisements for sailing dates.

THE MAPLE LEAF ROUTE:

THE DIRECT LINE

BETWEEN CHICAGO, DUBUQUE,
ST. PAUL, MINNEAPOLIS, DES MOINES,
ST. JOSEPH AND KANSAS CITY.

CHICAGO
GREAT
WESTERN

RAILWAY

F. B. LORD, G.P. & T.A., Chicago.





CHESAPEAKE & OHIO RY.

THE P. P. V. LIMITED line of the finest trains traveled over any railway track in America. It runs solid between Cleveland and New York, the route from Washington being over the Pennsylvania system. It has every modern convenience and equipment, and the Geological service has no equal if it has an equal. The roadbed is firmly bailed out of the stony rocks. It is balanced with stone from one end to the other; the greatest portion is laid with standard-gauge steel rails, and although curves are numerous in the mountain section, the ride is as smooth as over a Western prairie.

One of the most delightful rides by all the roads is that through the New River valley. The mountains are just low enough to be clothed with vegetation to the very top, and in the early spring every variety of green happens to the miles of foliage can be seen, while the leaves in autumn take on all the colors from green to scarlet.

These facts should be borne in mind by the traveler between the East and the West.

H. W. FULLER, Genl. Pass. Agent, Washington, D. C.

The Mutual Life Insurance Company OF NEW YORK.

RICHARD A. McCURDY, President.

—15—

• The Largest and Best Life Insurance Company in the World. •

Assets over \$220,000,000.

The Mutual Life has Paid since Organization
Over \$389,440,897 to Policy-holders.

The New Instalment Policy issued by this Company
Is admirably adapted to the wants of the Insuring Public.

EVERY DESIRABLE FORM OF POLICY IS ISSUED BY

THE MUTUAL LIFE INSURANCE COMPANY OF NEW YORK.

Burlington Route

TO ST. PAUL

BEST LINE CHICAGO OR ST. LOUIS MINNEAPOLIS

Ripasso Tabules cure headache.

The Fastest and Finest Train in the West



The Overland Limited

TO

UTAH and CALIFORNIA.

• FROM 16 TO 20 HOURS
SAVED BY USING

"THE OVERLAND ROUTE."

Double Drawing-Room Pullman Sleepers.

Free Reclining Chair Cars.

Pullman Dining Cars.

Buffet Smoking and Library Cars.

Send for Descriptive Pamphlet • 40-96.

Folders and other Advertising Matter.

(Mention this publication.)

E. L. LOMAX,
General Passenger and Ticket Agent,
OMAHA, NEB.

National Geographic Monographs

On the PRACTICAL PRINCIPLES OF THE EARTH'S SURFACE, designed especially to supply to teachers and students of geography fresh and interesting material with which to supplement the regular textbooks.

LIST OF MONOGRAPHS COMPRISING VOLUME I.

| | | |
|---|-----------|---------------------|
| GENERAL PHYSIOGRAPHIC FEATURES | - - - - - | J. W. Powell |
| GENERAL PHYSIOGRAPHIC FEATURES | - - - - - | J. W. Powell |
| PHYSIOGRAPHIC FEATURES OF THE UNITED STATES | - - - - - | |
| SHORES AND TIDAL MASSES OF THE ATLANTIC COAST | - - - - - | Prof. G. R. Ulrich |
| POLAR AND SUBPOLAR ZONES OF NORTH AMERICA | - - - - - | Prof. L. C. Russell |
| APPALACHIAN MOUNTAINS—NORTHERN SECTION | - - - - - | Walter Willis |
| APPALACHIAN MOUNTAINS—SOUTHERN SECTION | - - - - - | C. Willard Hayes |
| Mt. HOOD—A VOLCANIC MOUNTAIN IN OREGON | - - - - - | J. D. Dickey |
| THE NEW ENGLAND PLATEAU | - - - - - | Prof. W. M. Davis |
| MISSOURI RIVER AND ITS TERRITORIES | - - - - - | Cl. E. Gilbert |

Price for entire set of ten monographs, \$1.50. Price with bonus address, \$5.00. Single monographs, 25c.

Send with order to AMERICAN BOOK COMPANY,

New York - Cincinnati - Chicago

Ripon Tables best digestion.

WHENEVER YOU VISIT WASHINGTON,

YOU ARE INVITED TO INSPECT THE

* MAMMOTH DRY GOODS ESTABLISHMENT *

2000 FT. OF SHOW

WOODWARD & LOTHROP

Where the LATEST PARIS NOVELTIES are always on exhibition.
The attention of those who anticipate purchasing:

BRIDAL TRousseaux

is invited especially to extreme PARIS NOVELTIES in matched sets
of French Hand-made Lingerie, including Gowns, Skirts, Chemises,
Drawers, Coat, Covers, &c. These can be furnished in any number
of pieces desired.

HAND-MADE BRIDAL TRousseaux, personally
selected in Paris and exclusive in style and
design. There are over 1000 pieces.

\$10 to \$250.

CORRESPONDENCE SOLICITED. MAIL ORDERS RECEIVE PROMPT AND CAREFUL ATTENTION
TENTH, ELEVENTH, AND F STREETS N. W. WASHINGTON, D. C.

THE CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY

... RUNS ...

Electric Lighted and Steam Heated Vestibuled Trains between Chicago, Milwaukee, St. Paul and Minneapolis daily.

Through Parlor Cars on day trains between Chicago, St. Paul and Minneapolis.

Electric Lighted and Steam Heated Vestibuled Trains between Chicago and Omaha and Sioux City daily.

Through Sleeping Cars, Free Reclining Chair Cars and Coaches between Chicago and Kansas City, Mo.

Only two hours from Chicago to Milwaukee. Seven fast trains each way, daily, with Parlor Car Service.

Solid trains between Chicago and principal points in Northern Wisconsin and the Peninsula of Michigan.

Through Trains with Palace Sleeping Cars, Free Reclining Chair Cars and Coaches between Chicago and points in Iowa, Minnesota, Southern and Central Dakota.

The finest Dining Cars in the World.

The best Sleeping Cars. Electric Reading Lamps in Berths.

The best and latest type of private Compartment Cars, Free Reclining Chair Cars, and buffet Library Smoking Cars.

Everything First-class. First-class People patronize First-class Lines.

Ticket Agents everywhere sell tickets over the Chicago, Milwaukee and St. Paul Ry.

GEO. H. HEAFFORD,

General Passenger Agent, Chicago, Ill.

A VITAL POINT —

IMPROVEMENT THE CROWN OF THE ART.



A TYPEWRITER'S PRINTING MECHANISM

MUST BE ENTIRELY COR-
RECTED. THIS POINT IS OF
UTMOST IMPORTANCE.

EASY OPERATION AND
PERFECT EXECUTION.

The Smith..
Premier
Typewriters

Superior on This Point as Well as on All Others.

ONLY CORRECT
PRINCIPLE OF OPERATION.

The Smith Premier Typewriter Co.,

SYRACUSE, N. Y., U. S. A.

Catalogues and Information at Washington Office, No. 1416 F Street.

AN IMPROVED METHOD OF KEEPING THE SCORE IN DUPLICATE WHIST, COMPASS WHIST, STRAIGHT WHIST AND EUCHRE.

Since Duplicate and Compass Whist have come into fashion there has been an unprecedented revival of interest in the game, due to the fact that there *has* to be a large extent eliminated by a comparison of the scores made in the play of the same hands by different players.

The one thing needed to perfect the new method has been a convenient device by means of which the score made on the first round can be concealed until after the reply of the hands, as a knowledge of the first score often enables a good player to make a decisive gain, and matches are lost and won on just such little chances.

A Washington player has at length invented and put upon the market at a very low price a little device which admirably serves the purpose, and at the same time serves as a pocket and hand held writing implement, marker, and pencil case. It is called the "Cosmos Scorecard," and consists of a little polished wood tablet with a metal hinged lid that can be clamped down on the score in such a way as to bring all the metal plates over the columns in the "score" column of the card. You can be concealing your bid score as soon as awarded and until the hand is completed, in duplicate whist or the other series detailed in compass whist.

With players will always be the temptation not take care specified of keeping the score, as it effectively prevents their opponents on the same or another table from taking advantage without his accident or through a knowledge of what the hand is capable. The trouble with duplicate whist, especially, is that the reply is liable to be influenced by the play of the cards and score, and anything that favors or assists such a condition can give great gain to half play.

The "Cosmos Score Card," prepared for use with the counter, shows several new features, such as a heading for both Duplicate and Compass Whist and for the scoring for straight whist, euchre, etc., thus enabling the user to use one card to be used for any game of cards.

Closure corners, with tablets of quartered oak, maple, or birch, and bound in either gold or silver finish, go to a price of \$1.50, to \$2.00. By mail, a one dollar extra. Cosmos Score Cards, in the net package of six, postages 10¢ each, by mail free of postage.

Ask the jobbers or dealers, or order direct from the Central Agency.

Cosmos Duplicate Whist Score

| N | COMPASS WHIST | | | | E W |
|---------------|-----------------|-------|-------|---------------|--------|
| | DUPLICATE WHIST | | TRUMP | OPPONENTS | |
| HAND | SCORE | TOTAL | | HAND | |
| 1 | | | | | 1 |
| 2 | | | | | 2 |
| 3 | | | | | 3 |
| 4 | | | | | 4 |
| 5 | | | | | 5 |
| 6 | | | | | 6 |
| 7 | | | | | 7 |
| 8 | | | | | 8 |
| 9 | | | | | 9 |
| 10 | | | | | 10 |
| 11 | | | | | 11 |
| 12 | | | | | 12 |
| 13 | | | | | 13 |
| 14 | | | | | 14 |
| 15 | | | | | 15 |
| 16 | | | | | 16 |
| 17 | | | | | 17 |
| 18 | | | | | 18 |
| 19 | | | | | 19 |
| 20 | | | | | 20 |
| 21 | | | | | 21 |
| 22 | | | | | 22 |
| 23 | | | | | 23 |
| 24 | | | | | 24 |
| TOTALS | | | | TOTALS | |

National Geographic Magazine

Vol. 1

APRIL, 1897

No. 4

A SUMMER VOYAGE TO THE ARCTIC

BY G. R. BREWER

United States Coast and Geodetic Survey

The following article was written by Professor A. E. Bidder, of the Massachusetts Institute of Technology, and printed in the *Journal of American Fisheries*, having been presented before a meeting of the American Fisheries Society, Boston, April 1896.

PROBLEMS OF THE FISHERMAN AND THE COOPERATOR

AN ARCTIC NAVIGATOR. THE HISTORY OF THE LOSS OF THE

the sea, or I observed by daily observations. Our course lay east along the west side of Cape York in the West Coast of Northland, and then through the straits of Behring, where on the third day after we saw the first land. From this time on for over two months the Arctic waters were a part of every scene. At first they were a constant source of interest, because of their singular bulk, their varied outlines, and their

of the water. We however soon grew tired of looking them, fatigued

of 300 feet above the water and a length of 800 feet.

Soon after leaving the straits we began to encounter dangers, the Labrador done, which we closely followed. This was a

series of "panics" from a few feet to several hundred feet in

the air was entirely suspended until a change in wind or tide induced the panic to cease. To break through waves requires less than half a second at full speed, during the first few seconds. The situation of

at first, but we soon saw what the vessel could stand,

and perhaps throw us off our feet, with dire results. To break

is a long time, however, to become used to the breaking of the ice against the sides of the vessel as we lay in one hole or another.

While in holes we have seen extremely broad and cold sets of

the ice. One day when steaming along with only houses

broken about us were split to a narrow slot by a perpendicular

ice-wall, apparently cutting off all hope of progress, but as we

soon as we set the engine on this surface took an

especially hard right. We sometimes with care and even

luck, a matter. Some of these officers were familiar



as I had the effect of destroying the ocean swell. The men of New York got together on the Labrador coast en masse. Many of those persons who saw, and but few day thereafter, the destruction effects, were present a few hours.

It was while on the ice off Cape Chidley that we first saw

dogs were there that were running over the plain and for a short time I was afraid I would only get myself killed before I could get away. They were nearly the color of tan, and, ran

rightfully over the plain of Kowloon and taking up these boats were a pretty sight. A number of rifles were being loaded and the river bear was killed after a desperate fight I must say. A long chain was lowered for the dogs, so that they could hang to it and them never. They were following my boat and I had given the word for all guns to be fired first. When you go down first was left in charge of one of the Chinese party to make sure the return of the boat. As the sun set after night but a few weeks end we did not have even a moment's respite for the bush or a night respite, most comrade, bidding to the dogs to stop the boat's wake, kept on in the water and at a sufficient now it a long mark in the stringer at the front to get on and off of the boat to keep him off

who remained on the ship. The dogs were so very eager on the deck of the ship and remained on deck panting during the remainder of the voyage, growing great in size but not the least in affection either for their captain or for each other. They

Sixty-four

The second day along the Island of course because more attracting islands, proceeded northward. It is in every rocky, black, rising shore treacherous and uneven, covered with deep lava or a fringe with islands. In the southern portion the topography is low

effect of glacial action. Just south of Cape Coddough, however, and many miles have since, passed with me.

Coming into the harbor, the tiger was soon clear of the

harbor where kept it in exploration and investigation. All knew that there was located about ten years ago one of a number of

which the probability of regular navigation in this region. A

of Elk moose antelope. A more blank and desolate-looking bay on it were if the cabin, in the mud, where the rock was hot leaves, the mighty vegetal life was to it over a tree far reaching. It

It is the only one of the ship's boats that was lost, the rest being parted by the moving pack of ice, and a whale-boat was so freed by a boat crew who drove it in the rocks. There is a treacherous ledge of broken ice in the strait, the reef end so flat almost being some 300 feet. On the ice at the strait does not freeze until winter, but becomes fixed with an enormous expanse which is very thick and firm enough to support an elephant in summer in the greater part of the year.

In the way out of Hudson Bay we had our first good view of the Indians, and again we had seen a few of the race at the park in Labrador. Our first meeting of these up, much was a fleet of seals all, which travel over the water at a distance. It was so evident before the sun could rise on the date of our meeting on the water, what we were told were the pale-faced bear Indians. They rapidly approached and were taken in sight about mid day. The Indians were soon followed by an old, wrinkled seal boat 6 m. with the remains of all of the seals he had been hunting, salmon, mackerel, and dogs, as well as many of their entirely preserved. A young bear which seemed very tame, due to a quarrel he had among the majority of the round, fat bears who had with good nature. They were very anxious to find the two most likely person but a large of seals took over, gone, and so passed. We did not think long took no preference to either bear my time for all our

They were dressed in furs, the man and woman in pelts of the, except for a woman's little coat and a long tail to it and a large fur cap stuck on the back, in which the baby was carried. Their

the coat was of some sort of bear oil & with the way's hair were covering to prevent them about with.

After passing out of Hudson Bay, the Indian jet was made to enter Cumberland Sound. In the afternoon the sea completely filled with ice, and the coast was shaped like a crooked. To cross the older parts we also crossed the Arctic Passage. This

flights. Nor did he come to land in the course of one of the flights, when after a short to shave the unshaved, taking a bath of cold water, and a short participation in a few words.

The last view of the corner and coast was obtained early in the night of August 1, looking seawards and northwards. The coast of Hudson Bay from a point in the south to the north, two

To the north the upland slopes were generally rugged and stony. The most striking feature was the lack of good soil which is almost entirely absent in the upper part of the range but gradually increases as one descends. The slopes were covered with scrubby vegetation, the commonest being the willow, *Salix*, growing between the ridges. The shrubs of the upper portion of the valley were almost entirely *Vaccinium uliginosum* with a few patches of *Empetrum nigrum*. The latter was the most abundant shrub in the valley of the stream. The shrubs were followed by a belt of grassy meadows, the best of which was the valley of the stream of Animal 4, a small branch of the main stream. This was about one hundred feet wide. The grass was three or four inches high and the soil was very poor, being almost black with humus. The soil was light and sandy. In the upper part of the valley there were patches of over 6000 feet. To the eastward there was a series of spurs that extended between them could be seen for a mile or two all of the greater part of the valley. To the south were the hills of the Kuskokwim mountains, and to the



were scattered in the open water of Gold Coast, which is about 12 miles long, the greater portion being over the great barrier of the head of the port.

The most important party at Accra is, the principal seat of power of the district which was to be our residence for several weeks, and about two thousand men were said to be in it at the beginning of the year. They consist of tribes from inland, who through their proximity to the coast, have adopted some of the customs of the coast, and yet retain much of their original character, as well as their language.

The same tract is, however, the "Ekuakor" or "Great savannah," as it is called. The village contains about 30 houses and three hundred families. We left these Dusseas late, and it is far from being a large or respectable people. They are almost entirely separated from the rest of the coast, and are mostly known from their neighbors, or from us during the short period of our stay. In another month they are gone, fully isolated, and for two months they do not see the sea.

In the southern end of the province in Greceland and of the native names, the Danes have followed up the coast in the world's history. Between Cape Farewell and Cape Coast, however, they found no evidence of habitation until they reached the

area divided into twelve districts, of which the name is extremely and is the most important. In each, and there are usually four government, or administrative government, having charge of a certain population.

not 100 miles, no slaves or other foreigners are allowed to settle in the country. The whole is under the direction of the King, who has

the monopoly of the trade of the land. Supplies are sent by authority of two ships, which bring back the produce of the country to the port. European goods are furnished to the King, and a slight advance of a cent per lb., and they are paid quarterly, fixed in advance, once every five years, for the King, stores, etc., which they bring in. All other trading than

Government posts, except by annual post revenue or a letter-tax. The king has been too protracted in his rights as a private man in the port. The new government is to provide, however, the Danish government, that is to say, the coast and trade, during recent years having had to have been as much as

had all been to N. Almost as you will see we travel with a
large load of coal and the load does not get much on board
but that appears to be the horses that are here. I am given to understand
that the horses are good and well and are anxious to go if they
are to be sent to N. I am told by the men
that the horses have been to N. before but
it has been so long since that they do not know them now.

With the help of our dear friends we have got the car out of commission, so we will be at the Eska show, although I am not able to do much.

relative for her, against the ruling master. I am
writing this place now. Then





t until then, unless indeed I never wear a skin jacket
bands and girdles which it is negligent to stand by. He has
not one of these, to too him is the blame, caused by his
"ignorance," many varieties of whale are found on the coast. The
seal is good for clothing, and covering, and traps, the best fuel
for fuel and illuminant for oil, and a valuable for food. The highest
ambition of a young Eskimo is to become a successful sea-

man. They are the bravest in skin boat when it comes to skill,
courage, fight men, and gracefulness. With these small, fri-
able canoes not over 15 inches wide, they do not hesitate
to go out into a water an hour's walk from shore, the
sea, or landings. They are expert even in bad weather.
The most remarkable of which is for the

most part getting up a row of water and
rowed about and clung about the small

which go to the deck with a horse, and I might be allowed with a comfortable use of his saddle to get ashore. In addition, the revolver which is now given you from the Indian Army is the best pattern and has a double action pistol which can be used either of powder or smokeless. A few other articles you will probably want to have in starting, will be a small gun for animals, and money, the Indianer to follow him goes through a great amount. To winter the Indianer there should probably be no horse and sleds are unimportant. The Eskimo dogs are good at all hostile nations, as it is very difficult to find with them. The snowshoe dogs which are used to be observed in a single day - periods of 100 to 150 miles or more than a week. In that case, the dog teams load more than 100 lbs per year. It is necessary that they be well and trained daily.

The Indians are a childlike gentle race. They are honest and remarkably free from treachery and suspicion. They and their skins are entirely lacking in Spanish treachery. The very

contrary. It is impossible without a treaty of double and veridical formation. It is just, we to express the feelings of a long English mother to a single word, how none of them are forty letters a chapter. The investigations of Rank have shown that the native

has but one common origin. He estimates that there are about 16,000 Eskimos, of whom a marshy five in French Canada,

the greater portion of North America, and a few in Greenland, Norway, and the British Isles.

From L. St. Paul several trips were made to areas, built for the great pictures at the head of the fjord. The largest of these is the Kinnarok. This is a flat plateau, from which, the large trough of Lake salt water, has a width of about four miles, a height above the water of over 200 feet, and a center ridge rising to a height of from 21 to 26 feet per day. A single leading bank is said to a glacier tongue estimated to contain 24 million cubic yards of ice. At the point where the fjord is formed, it is open to the Fjord of the Ice. On each side of this lake, we saw a great mass, 500 feet long, break from the ice; it remaining and carrying up water about hundred, the surface of

and it does not appear to be weathered or broken down
but it is however on the top, where it may be ()
broken
the soil being largely composed of sand. It is
more than half the surface of the gulf which is
composed of sand and gravel with some fine
clay. The soil is very poor and sandy (light brown
color) but it is good for the growth of the trees. A man
from the gulf to the Rio Grande river (near the Devil's river)
gave us some idea of the great richness of the soil.



work along the river. As far as I observed I found a bar north
and south and east and west with the following
proportions: (With my bar you have to take account
of the ocean). At each in excess of its original width
the river was at the heads of the glaciers, which were (I suppose)
cut off from above by the ice sheet (at the time). As you pass
them on the left the river was supposed to be formed by the
strength of the water flowing down and the combination of
precipitation falling on the surface of the hill down and
the ice of the glacier. I am on the right side of the hill, I
am surrounded with the exception of a narrow fringe, all the
country to the east of the river () to the west of the

recess, and the dangerous character of the macabre but also the

sublime. That the world was ever more extensive I had
to know by previous to the bounded situation and glacier belt.

The climate of Greenland cannot at one time suffice to be very
mild. In the winter (July) most of these small posts are covered
with snows of such semi-tropical trees as the big red birch.

The tree is not much to be seen out of the opposite side of
the arctic. In the hills the small elements of climate are



present, we find it right in front of the sea-shore, but the
ocean wave overcomes. Wherever there is no land there is a
shrub (willow) flowers and grasses, but we find it is trees. A
curious tree red cedar that is at the Park (willow), which flows
away off the swamp, always brings the greatest heat or, the
usual explanation being that the finding of the wood is due to
its being derived from the greatest distance to the sea.

The *Hoppe* called for us at Franklin on August 1st, 1870, on
the first voyage, followed much too soon on the next day after
the same. The only see me a form we entered, and who of course
was very afraid. Off Cape Flora the *Hoppe* was unable to go

This was to be first seen above
the clouds.



every 10 degrees of longitude, all the 48 persons comprising the passengers and crew being well informed on the subject.

The observations made were a series of horizontal declinations carried out by the writer in connection with the work of Professor Hartmann's party. At each of the stops at places where there were good tidal magnetic observatories were made observations of the variation of the dip angles, both from true east, the dip of the dipping needle, and the angle of declination, or magnetism. Two sets of observations were made enough to the west of the North Pole of the world to allow the dipping angle to stand within six degrees of the vertical. The Great Bear stars were used to the east of the angle of a pole that the compass needle pointed more than west than north. The horizontal magnetometer failed in these experiments as very weak or no effect of the great dip angle might

be produced going east. At no time stations from Halifax, Nova

Schotia also performed observations for the measurement of the dip angle, but following the lesson of the French mathematician

may be soon passed by it implying the force of gravity at different latitudes. By a well-known law, the force of gravitation of a small body will be proportional to its mass, so if a series of

body be composed of components only few such observations have been made in high latitudes, where they have great weight in the problem of the figure of the earth.

At the first some relevant reading was done and the following paper by Prof. G. R. Milne was selected for discussion:

THE ANGLINAGE BASIN OF LAKE SUPERIOR

by DR MARK W. HARRISON

President of the University of the State of Michigan

Lake Superior is the largest and one of the deepest, not only of the Great Lakes of the St. Lawrence basin, but of all the bodies of fresh water on the earth, and it possesses some singularities of interest as of history; yet though it has been so long known that it was originally thought to be the youngest of lakes, and I have charted several courses of fair recurrence, no records for the latter were found out of the 17th century, and though it was visited with infinite accuracy by Le Sueur & Marquette many years ago, there was nothing then done which did not receive its present position. This is

the more curious because the extraordinary wealth in marine fish has been recognized from the beginning and has for half a century furnished an important part of our national wealth and importance, and some traces of the species have shown up until quite late. We are however much better off now. It is the purpose of this paper to give a brief but exact account of the principal features of the lake, to be expected at present, to be used as a guide to its waters and give a method for its use for dredging the port.

The statistics of Lake Superior are to be found in the mid-yearly statement of its geographical features I have had before me, fragments can be wished you by Mr R. F. Dethleffs, of the Weather Bureau, who has graciously granted to my request.

in full time

Dr. Alexander
C. C. Mendenhall

Tellus Island - Dr

Lake Superior - Size, Depth & Volume of Water

Size of Lake Superior

Total area of lake is about 31,000 square miles.

| Size | Surface Area |
|---------|-----------------|
| S. Lake | 1,200 sq. miles |
| N. Lake | 1,200 sq. miles |
| W. Lake | 1,200 sq. miles |
| E. Lake | 1,200 sq. miles |

Area per

Population per sq.

* Approximate values

Total water surface

* Total capacity in cu.

It is interesting on the lake to look across
to a nearly levelled bay and distant from the
shore, covering those

| Size of Bay | Water surface in cu. |
|---------------|----------------------|
| Michigan Bay | 1,200 cu. miles |
| Algonquin Bay | 1,200 cu. miles |
| W. Mich. Bay | 1,200 cu. miles |
| Thunder Bay | 1,200 cu. miles |

Total area of bays + + + = Total capacity in cu.

Resultant approximate water surface = 31,000 cu. miles approximated

If the 52,100 square miles of the total surface of the lake, there
are out two Algonquin Bay or 23,000 square miles and on top of which
comes up to 28,000 square miles.

The boundary line across the lake between the United States and
the Canadian States is 296 miles long.

With a surface area of 32,000 sq. miles Lake Superior is
the largest lake in the world. Next comes probably Lake Victoria
of Uganda or Lake Tanganyika, in equatorial Africa, with an area
of 25,000 to 30,000 square miles. Lake Superior is also
24,000 square miles, and nearly twice as large as Lake Erie
at 12,000 square miles and Lake Ontario 7,000 square miles combined.

The total area of the Great Lakes of the St.
Lawrence are given by Scherzer¹ as 65,255 square miles
and all of it is covered by Lake Superior +

¹ Considering the surface area for a larger latitude and circumference.

² In 1860 the lake was 100 feet at its deepest, 30 miles, while now it is 100 feet.

of the island the largest and most remarkable is the one to the

Royal man. As seen from the north shore, it appears to the

unknown they close to either of a low, squat and pulled at
Keweenaw. This is very uneven ground on the island and a man

July 2 in the amount of money which has been expended on

island in food so far as I can get also. Copper & Zinc
Company paid \$1,000,000.00. The deserted buildings I did not care
about but as far as following a year or two ago by the front door and
probably a room and a half for the number of dollars have been
expended in getting up Isle Royal with traps traps to rotting.
The return of the most abundant of Isle Royal have probably
given him a may could be to give traps them up if in the way
the traps a great many of the trees of poles having pulled to its
height reaching at times a height of 400 or 500 feet above the
water.

is Island will be most interesting combination of fixed structures
to be found on the continent. Fingers and arms of the
shores large and easily plunder pen insas, the latter extreme

of rock and water the former stony and rocky but generally cov-
ered with a dense growth of dark green grass and ferns the

edge in bright weather, but extremely confusing when the
weather smoky or foggy. The population of the island is gen-
erally small and cover per acre. It was at such an early date
that the western portion of the island only 12 miles from the
eastern point of Munising Is. It was at that time a country by
itself, but there were not enough permanent few houses to fill the
efface and it was not until the Ilionton colony on the north lake
It has no jurisdiction. There is all natural water, there is no
heat, though some in quantity, and the usual year colds are not
common can be raised. The native animals in the island increased
not as larger than the year of 1810 and a few years ago
when a small drove of cattle came over on the ice from the
main land to the peninsula between Isle Royale & the north
shore are not only 12 to 15 miles apart, and so deep water had
to bring cattle, but it does not last long in summer, and the
cattle still remain on the island where, and the number, they

THE SHORE AND BOTTOMS OF LAKE S. JEFFERSON

had become in this a slave of a sense of time, and were open to him. There are wild birds sometimes seen alighting and taking wing with a longing eyes turned thither with care, as if anxious to return to former scenes with the expiration of the next hour before them. The very sun, so endearing with his smile on all else,

comes down to us, varying from 1,000 to 1,500 feet from the bottom,

so far as parallel we may look to the rounded and uniform slopes of the great ocean.

extreme north of the lake, and with the projecting ends of the island groups extending from Pigeon River on the west nearly to St. John's on the east a low ridge to Gull Lake. In front of this lies the first great island, so the "spirit" to Thunder Bay, is the island no longer from its original nature a British name—strange white, and a trifle greater than its American namesake. This island is an acre of 22 square rods,

sufficient to make the two appear to be separate entities. The western, or a part of which is 250 feet above sea level. The eastern, upper, are very abrupt at all times, and the upper is nearly inaccessible. On it, however, is a large flat or sand bar with a small flat island with a breakwater. This off of and in the "spirit" proper, is much larger but only 70 feet high and relatively accessible. Next, going seaward, is Thunder cap, an extreme point of the peninsula between the outer bay and creek bay, projecting and rising directly from the lake in another acre of 22 rods from the surface. It is the highest point immediately on lake, so high it is of similar form. The precipice is about one hundred feet in height, especially on the west side, and some degree of time. It is covered daily by the water about this part of the peninsula to the alleged origin of the name of the cap as well as of the bay over which it stands vented. The "spirit" for

, a mile or so from west to east. These islands are truly with but in general a promontory, as I say description of the scene is a

and to a time of a general upsurge of corn and sugar

country more long, and owing to many factors a deep. Like the preceding, it is of basswood, cedar, and larch timber, except on the north, where spruce predominates. The soil may be heterogeneous, and the forest soils are very poor indeed. Its water resources are the best after Lake Superior, with the highest lake, a chain of elevations of a mile high.

In Lake Superior there is but one steaming port—that is, a cluster of buildings which are greatly surpass all the others, situated at the mouth of the Apostles Islands, or, more

appropriately, where the river empties. The individual communities, however, have provided anything but modest harbors, to wit, an order of size, Northland (23 square miles), Stockton (16 square miles), Duluth (12 $\frac{1}{4}$ Oak Park, Grand (4), Marquette, Munising, and the like, each 2 square miles; Houghtaling, Apostle, or Devil's Island); then the south and north Twinn. The total area of the 11 villages being 64 square miles. The largest of the twelve towns are situated by the lake and are covered with a great mass of timber trees. The smaller are hardly and never. They were settled early in the history of the country west of the lake, but the population has since increased but little numerically. There is no portland stone on the islands.

In the state basin of Lake Superior is relatively small. It can have not been so extensive & in point of fact it can be measured with the same accuracy as that of the land it covers. But the total area may be put at 12,000,000 acres. Of this 10,000,000 is the lake itself, 1,000,000 is the land, and of the land 80 per cent is Canadian and 20 per cent American. The margin of the watershed is low in a direct current, and it is generally defined along its tributaries almost as in the arid belt, save found where irrigation strips & types of water, isolated and without drainage, except that connected by long watercourses that thus watershed is 2 miles. The lowest points of the water divide are on the southern shore of the St. Marys River, where it runs out in a few small streams into the lake. It gradually rises toward the west, and at a point about five miles southeast of Marquette first reaches a plateau of 400 feet above the lake surface. South of here the

THE AREA AND DRAVING BANKS OF LAKE SUPERIOR

is about round, or 900 or 1,000 feet in diameter at the maximum, in the mountains of northern Minnesota with no height, in

the Westem and northern Minnesota. The separation of the waters of the St. Louis and the Mississippi, in where they cross each other is but a few feet. The greatest known point of the watershed is at the Mississippi, this is in a hollow (a meander), where it reaches 1,000 feet above the lake, and its highest points are higher. To the north of the lake the watershed is more distant from the lake and not so well defined. The topographic features on the south side are low rolling hills well rounded. On the northeast very steep, often precipitous.

Caused by falls of the regular type made of the "cannibalistic rocks," which follow the west shore of the lake and take some places from the watershed. As soon as the Canadian

marked trail in an elevated plateau, relatively flat. Then again the streams have cut down 50 or even 100 feet, forming a long, level valley or narrow ravine, but cutting generally nearly vertical walls. This structure is very characteristic of

each of Lake Superior or the basin to sunrise in heights by a comparison to that and the river St. Mary. The drainage area on the south shore is narrow, but not more than 20 miles wide, and seldom more than twice that. The tributaries to the lake are, are very numerous but small. There are about four score that are 20 miles or more long but few of them exceed 50 miles. They usually descend rapidly from their source to the lake. In some cases, as in that of the stream at the Pictured Rocks, they have a course nearly so long as near the ocean, and the streams that enter at the same level as the lake are shorter.

1
stream at Duluth, has a length of 14 miles, with a base of 20 square miles.

At the extreme western end of the lake enters the St. Louis river, considered the mother-stream of the lake and the river of the Mississippi. It is 200 or less long and has a basin containing 4,571 square miles. The main tributary remarkable is

in Copper Lake, 20 miles from the northwest shore of Lake Superior.

estuary. Its maximum flow of water is not far from the maximum* at 1,200 cubic feet per second, but it is probably larger. The rapids are at the thalweg, below the estuary, the channel, and not a few miles above it. The present or a considerably smaller stream will often fall within a short distance of the much stuporous levels in

the valley to these estuaries under a head of one foot, as will follow

from the following statement of Mr. G. W. Ladd, of the U. S. Geological Survey:

"The level to which the river will rise, by the proposed dam, is the level to which the river will rise, by the proposed dam, if no water

is taken off and is used by the storage in the artificial reservoir of the dam. It may be asked, why do we give the water a supply of water will be available for use in the future? I think you will notice the greatest water power in the world."

Consequently if the water is found in two feet less of the dam is made to pass through the reservoir, it will empty into the Mississippi River and will contribute to the water power of Mississippi instead of to that of the lake.

It follows that the water will be given to the estuary at the mouth of the Mississippi. This has so many features of interest that it becomes a subject in itself which we have perhaps sufficient knowledge that

the subject and action of the water at the river end the water of the

SIXTY-FOURTH DAY OF LKE ST. JOSEPH

the. Formerly the lake extended up to what is now known between the two islands. The termination of the lake back was recognized when the upper one was first sighted from here. The distance to the upper lake is about six miles. From the outlet to Superior is five miles. The outlet of the lake is of seven feet, and it has taken six years of work to have it enlarged. At the time when the outlet was cut there were great difficulties, but before difficulties were over, and the latter half of the difficulties were over, the outlet was

about 200 feet wide and not much broader than it is to-day. It is now reported it cost \$10,000, but it never cost more than \$1,000 per foot, and at no instance was there waste of labor, owing to a lack of progress of the contractor. The contractor is there. Now up the lake where the motion of the current is strong, by a distance of 100 feet the lake water is cut off and the waves run in, driving it up into a bar rising above the surface, stretching in an easy curve from one side of the lake to the other, touching an island very separate from the lake. The rock on both sides of the river back proceeds to the right bank until it is deep back with possibly a little in the left bank, but. When this is completed the rock is driven or forced into the lake, you step on the bar so formed the whole process is repeated, and the river has ever reached its present point. These successive steps are easily recognized by the topographer, and he should return to his table. The first is the earliest, and the remains are found in Spirit lake. The next in order of time is represented by Chippewa point, last by St. Joseph, and the latest by Minnesota point.

It will be interesting to go into detail for the last, not in progress of development. The bar at Chippewa is at Minnesota point, it is about five miles long, is from 200 to 1,200 feet wide, and extends in a curve from the Minnesota to the Wisconsin side. It is interrupted for the passage of the river above to the Wisconsin side. The average height is 12 to 15 feet, but toward the Wisconsin side the wall has a slight gradient of about 2 to 2½ feet, and a small area of 100 feet. It is made of sand and gravel, is covered with small trees and shrubs, and is a favorite place among the Indians for the storage of fish. It is about a mile long, about three miles broad and one mile wide, and it is not far away when the river is now 8 feet up. To keep it available for commencing early in the constant efforts of the engineers.

In order to accomplish the above the several dredges of St. Paul, a canal 100 feet wide was cut through Minne-

water port at the French cap. The port of Superior is entered by the narrow outlet—the passage unhampered by the river.

Not indeed too great an advantage over its rival, Superior had a lake extending across Superior bay, on the south side of the mouth of the river. It was expected that the river would not reach its energies on the interior of Superior, but proceed on eastward to the lake for Superior. With that fresh, new and clear benefit of river communication, the opening of our port by the then unchartered, the stream did what was unexpected in a progression to fill up the Superior channel. So quickly lumbered and dyked clear spaces of land & water by the end of 1856 the port.

The most west shore, from the St. Louis to Two Harbors, is very steep, bare & rocky, bounded for about half a length by the "suburb" of "Iron Fox" timber-mountain. Along this coast a distance of thirty miles, there are only a dozen or so of short streams by water running than creek. These form a step along the road only a few rods wide, while bound them comes the main of the drift, for it is that of the Keweenaw drift. These streams are all so small that the heavy surf on the coast becomes the channel of great sand, which will move & through what is the most seafar. Into this, at low water the beautiful Keweenaw River, falls in, with a basin of 7000 feet in long. It is a picturesque stream, well known to the Indian voyageurs, for we find it with the best roads from Lake Superior to Whitefish & the good old traces of the old spotted away of long ago remaining. It is a lower course ground Fort William—its deep brown waters flow rapidly through its broad, flat, low bottom water at the greater part of the time. Higher up it has falls or rapids, and few streams charged by its one tributary portage. The outlets are in Lake Superior and Michig. lakes, from the latter I would suppose to the most probable that river just Dog lake is reached. It is only below this lake that it receives the baptism as name of Keweenaw, meaning "that which goes up above".

Higher up it has falls or rapids, and few streams

charged by its one tributary portage. The outlets are in Lake Superior and Michig. lakes, from the latter I would suppose to the most probable that river just Dog lake is reached. It is only below this lake that it receives the baptism as name of Keweenaw, meaning "that which goes up above".

The extreme northern point of Lake Superior enters the St. Mary's river, of which it is the chief, more easily made that it is the mother stream of the St. Mary's river system. The name retained on the book that this stream is the outlet of Superior lake, just as the St. Mary's is of Lake Superior, and that the Great Lakes consist one of

of six (when St. Lawrence is included), out of seven, and Nipigon is the seventh and most distant. Nipigon like its neighbour has

river, a small lake among long boulders, therefore a shore of 250 feet. It is a Picturesque stream, full of rocks and full of fish. The bay, surface, and lake which bear the name of Nipigon treat us to "dirty water," though not so far off the best fishing in Lake Superior or Lake N., given in oval in fact, is not to be found

at much southward than its head with a circumference of 2,000 or more miles. Its shores are very much indented, and it contains no less than 1,000 islands of various sizes. The greatest depth, as far as possible as 700 feet, which would bring the bottom to the bottom of Lake Erie and at 400 feet above sea level. The current at the mouth of the stream, and the fall to the north, is so rapid & heavy as to break it to pieces just below the village, in which case Lake N. passes with all the violence of a tidal day over the L. in the highest point possible. The lake occupies about a mile in length, the land area of which hardly surpasses the water area. The principal feature is the rocky ridge which runs from Lake Superior to the 50 miles to the west of Lake Nipigon. This ridge is said to lie on the "back of Lake," or watershed between Hudson Bay and the St. Lawrence basin, and its waters are reported to flow both ways, part into Nipigon and part by one of the Adirondack rivers, to James Bay.

There are several other streams in the part of the area which 100 miles or more long, namely, the P., the White, and the

This last mentioned was well known to the voyageurs as it was a part of the regular route from Lake Superior to James Bay. At its mouth was the N. clay-coated bottom, which, with Fort William, on Lake Superior, formed the strongest fort on the north shore probably a mile long, and the western end of which is almost too rocky to wade across. Indeed, the north shore of Lake Superior is bare, so that the bulk of it can be seen for more than a mile, and the south shore beneath its often turbulent waves. Just west of these two old structures is the Hamlet of St. Ignace established by the French Indians. Until Agawa's time no lake ever ran through this place. It is an event

Mr. George A. W. Gandy,
Chief Engineer, United States Army.

Recent advices from the East point to the early completion of the great Siberian railroad, which will be the next strong link to bind all Russia together. The continental interests of the world. It therefore becomes one of first importance to present to the publics of the National Committee Management a plan of what it is necessary forward to the Department of State by our Consular officials, Moscow, Khabarovsk, and St. Petersburg.

The Russian steamer for 1897 negotiates the Bosphorus to the Black Sea, and thence through the Dardanelles to the Mediterranean. Passengers travel in less than a week, and have been known to run at a cost of \$10,000 per head, and in four days to sail to the Amur river. Passengers, mail packets, and freight will be pushed up by the steamer to Chitinskaya, and the trip over the British Reindeer section of the Sib. road to Vladivostok, making the distance from London to the Pacific sea in 17½ days. After the first few years, when high tides of spendid summer navigation, the trip will be made in nine days.

Travelers to and from the East will prefer to make no journeys in eleven days inland for taking it as now over seas in 11½ days. Tickets from Moscow to Vladivostok are favored only by railroads, first class, from London to Moscow being now £50 marks \$65.70. The ticket from London to Vladivostok is to consist of 1st class coaches \$11.00 first class; second class 10 marks, or 100 roubles. A ticket to Japan being via Siberia cost \$100 marks £12.00.

It is to worth a thousand to think that a Russian traveler is able to take the great railroad and cross the continent of Europe to the United States without a change of car. At the beginning of the year the U. S. Post office in St. Petersburg was planning to extend the line of telegraph to the Amur section and then to extend it from China, through Khabarovsk to Vladivostok. There are along the river Amur or to Khabarovsk to join the Trans-Siberian railroad, or a connection to the Amur railroad. The construction of this line has been so much retarded, difficult as it would probably be, owing the cost of

Lapoung Blaiblatt would be very cheaper and shorter the construction of the road, but would present other difficulties. Negotiations were begun, and the Chinese government granted a license on. The Eastern Chinese Railway Company was formed to construct and operate the railway. The actuary of capital was to be determined by the Year, and an important order which was issued in November, 1896.

The association organized under the convention of August 17, 1896, by the Chinese government, with the Russo-Chinese Government Bank, is to construct and operate a railroad from the

Sea of Japan. The enterprise may, with the permission of the Chinese government, engage in coal and other mining, industrial, and commercial enterprises in China. The Russichino Bank takes upon itself the duty of organizing this company, who accepts the rights and duties granted by the above-mentioned convention. Such a car be paid only by Russian and Chinese subjects, or if the company will pay the Chinese Harbor Duty during eighty years after the opening of the whole line.

The Russian government guarantees the revenues of the company.

The company takes upon itself on the part of the Chinese government and the banking obligation, i., The Chinese Eastern

(1) to observe in relation to safety, convenience, and movement of passenger and freight, (2) to maintain the Chinese harbors in a way to be kept up to conformity with the ten thousand kilometers of recent railroads; (3) all trains of the Russian Trans-

Siberian and Trans-Siberian railway, of passenger and freight trains in direct connection; (4) the company binds itself to construct along the road a telegraph and to connect with the telegraphic lines of the Russian post roads, and so promptly communicate with each other. Telegraph connections to and from Korea and Japan. On all the existing arrangements shall not incur or interrupted

regarding the Chinese Eastern Railway until the date of conclusion of the present contract and agreement. In case of a sum-

Proceedings the Chinese Eastern Railway agrees to submit to the consent of the Russian Minister of Finance. If the projects of the Chinese railway the law shall not be sufficient to carry out the necessary improvements, the railroad company for which it is established to the Chinese Minister of Finance, shall make by agreement between the company and the Russian government, which cannot be raised during the whole period of the concession without the consent of the Russian government, the following rail packages and others a account carrying the salutation to be carried free of charge for the purpose to be used partly assigns to each passenger train a part of carriages. The

carriage on a express, and the carriage, keeping all articles of China must be paid by the railway company one of three. After more than years of concession has the right to withdraw from the Chinese government. A bill of the railway can not in any way release the obligations.

The following table are given by the Chinese government to the railroad company. (1) The passenger baggage no longer exchanged in trains from one station to another at the times; 2, the tariff for passengers, freight, telegraph, etc. according to be seen from in China does not exceed; 3, the Chinese imported and exported to and from China and Russia will pay

at Chinese general customhouse (3) goods imported by sea for the other which pay the establishment a sum of one-half of the import duty, and are free from a bill of lading.

The company is at liberty to buy the construction materials wherever it sees fit and materials will purchased in Russia will be free from Russian customs duties. The stock page 4, is five

5,000,000 paper gold \$1,250,000, and is divided into 500 shares, paid up at par. The Russian government does not interfere with the shares. In addition, the better off part of its properties, subject to due, approval of the Russian Minister of Finance. The amount and liquidation of these funds will be guaranteed by the Chinese government.

The enterprise is to begin work in August, 1897, and the line is to be completed in six years. The new line will begin at

RAIL, KLAUSER-HAN, AND HENGEL, AND CONNECTING THE NETHERS.

1,420 miles, 2,133 miles) will be in Chinese territory. According to the original survey of the Sino-Soviet line, the route through Manchuria will shorten the Siberian railroad 513 miles (341 miles). The Manchurian line has easier entry of both railroads and is no productive soil. The river valley of the Songhua separates the Amur region to broad and open over Manchuria (between the great rivers, the same elevation nearly worked).

At a recent number of discussions for Yamaguchi Economic and Statistical Bureau, presented article by Dr. Shiozaki "Comparing the importance of the Manchurian railway." He pointed at the conclusion that with the article, the way would first only open up the

country who construct or maintain. It will be of enormous importance as a transit route for goods of the Chinese from China to Japan, and also for exchange of traffic between and to these countries.

In a very limited degree, China will estimates of production and free trade duty, but both trust an increased output of grain cannot be expected so long as low prices rule. It would be necessary for the Japanese government to exact a lower rate than his high price law imposed for integrating its home market. Small I just as

we all know and a possibility and this work I greatly welcome about it, except a certain exception.

GEOGRAPHIC LITERATURE

Climate of North America. A Geologic Lesson for Students of Climatology and Geology. By John C. Hosmer, Professor of Geology in the University of Michigan. Pp. x + 400, well illustrated. Boston: Ginn & Company. 1907. \$1.20.

The present Russell's preface "To the Reader" is a statement of "strange and many different" features, "in fact, of the several parts of the continent that are in the quarters of the North American continent. The reader will find a history of existing glaciers and of their past influences should he have any interest in that. From New England the reader comes to one of glacial origin, preglacial, and continental, and unequal country we find, while the greater part of other geological history of North America is related to the people, mainly to

of the Alps, who by his type for the vast continental glaciers of the

In this respect, but more extended to the East of Alpine altitude,
between the European Alps and the Southern Alps of New Zealand,

Mr. Professor Russell is well qualified to prepare a review.

He has ably solved this problem. In the first part of the book appears a short or a half of a descriptive paragraph, and then follows the start of a long implemental work. This and elsewhere he has an appreciation of processes and products. The writing is personal also, which is very

charming, giving the work the form of a narrative history with the symmetry of a monograph. The first chapter is an introduction, in which climate and general features are set forth. After summarizing the "marked characteristics of glaciers," he turns proceeds down to sketch the question, "What is a glacier?" "the principal distinction, it is

often to be found between them and mountains. Glaciers are high and always above the snow line, and having to require water may be composed of ice, &c., below the snow line" (page 10). He then returns to

introduction, this in the book. The second chapter relates to the general types denoted respectively by the glaciers of the Sierra Nevada, being those of and Oro California and the Cascades mountain, the glacier of Canada,

the last. There is a chapter on the climatic changes indicated by old glaciers of low temperature and another on the submergence of a sea, in which a third and last chapter is a summary and retrospective discussion of the history of a glacier, in which the relation of observations and conclusions of the author are summarized.

The closing portion of the work is very valuable for I think worthiness the opinion of English have been so pleased a few trifling errors in the scientific portion might have been strongest mind, but teachers and others will find a popular account of the glaciers of North America.

W. J. M.

1. *The sea on shores, sand, weathering, and stone.* By George P. Morris
Curator of Geology in the National Museum, ed. pp. xx + 411
With 100 numbered illustrations. New York: The Macmillan Company
1912. \$1.00, net.

During the present period it is a duty of students, scholars and other
men states outside Europe attention to the sea land, while it may be ques-
tioned whether they have yet observed in great cities a selection of the
current such a literary.

Professor Morris, already favorably known
through professional work and general writing in a popular work on
"The sea on shores, sand, weathering, and stone,"

continues his studies. He has also had the time fully available and unpre-
judiced of his land slopes. In this paper the first part of the article is
devoted to soil and the work last summer at least in very summary form—
and preceding the first round of all annual reviews. Very significant
every teacher, every student, every statesman, ought to remember such a
contribution to important problems as this useful treatise.

The work is arranged in five parts, each divided into several of applica-
tions. In the first part particular account is given constituting, there-

is provided briefly and classified as follows, (1) aqueous, (2) aqueous, (3) con-
solidation, (4) weathering, &c., thus falls out of the work dealt with rock slopes
and with first the land involved in the development of top soil humus,
consisting of the soil surface. The next two parts are by far, respectively,
to the weathering of rocks and to the transportation and
consolidation of rock slopes, and in them the main working
processes are admirably lucidly described. Part V
originally of the work is concentrated, is entitled "The sea on
shores from their origin derived from fossils marine & terrestrial and about the
transformation from sand, making the last rocks to cemented by dolomite." The
writer for introducing a new word for dolomitic, although he has not other

admirable term can suggest "dolomitic," "dolomitic," "dolomitic," "dolomitic,"
"dolomitic," "dolomitic," etc., for transported sand and "sand of the ocean
bottom," "gravel," "pebbles," "fragments," etc., for the products of rock slopes
very strongly limestone and dolomitic. No name has been so far proposed satisfactorily.
However, if any one can introduce any term has got nothing to do it
sufficient to be used whether the name is descriptive or not. In the mean-

time a secondary and, it would seem, the former is utilized as to pro-
vide land slopes and to sea shore deposits, while the latter is a broader, yet
a geological deposit, for coastal deposits, of marine character, and of
terrestrial character. In addition, the soil proper is mentioned, as a tertiary
feature from a quite large respect to rocks on composition, mineralogical
affiliation, and physical condition, as we have in the respect to weight,

and so on. The great complexity of the soil is adequately recognized, and the simultaneous interaction between the chemical, physical, and vital, by which the soil is produced and modified, are set forth appreciatively.

In treatment as in subject, Professor Merrill's work is notable. It is strictly up-to-date, embracing the results of the latest researches, and duly recognizing the work of contemporary investigators; also it is made admirable by clear typography, good paper, excellent illustrations (many of them photomechanical reproductions), and a full index.

W. J. M.

GEOGRAPHIC SERIALS

The *Geographical Journal* for March opens with the minutes of the Warren meeting in London. Somers Monro and Anthony continue the narrative of their explorations in Abyssinia. Mr Dawson summarizes the progress of the geographical work of the Geological Survey of Canada for the past year. Mr Vaughan Cornish furnishes an exhaustive article on the Formation of Sand-stones, and Professor Leo Beaufort an article on Egypt and Abyssinia.

The *Scottish Geographical Magazine* for March opens with an article entitled "Cape Juby," by Mr Fred S. Layton, which contains a quite full description of the north-western part of the Sahara. Mr John Murray has an article on the "Judson Shool," a submarine formation in the Coral Sea, in the south-western Pacific. This is accompanied by a chart and profile showing temperatures of the sea water. The Nansen expedition receives further notice in the form of a review of Dr Nansen's book.

The Royal Colonial Institute, of London, is an organization for the increase and diffusion of knowledge relating to Great Britain and her dependencies. Its purpose, as stated in its by-laws, is "to provide a place of meeting for all gentlemen connected with the Colonies and British India, and others taking an interest in Colonial and Indian affairs; to establish a reading-room and library, in which recent and authentic intelligence upon Colonial and Indian subjects may be constantly available, and a museum for the collection and exhibition of Colonial and Indian productions; to facilitate interchange of experience among persons representing all the dependencies of Great Britain; to afford opportunity for the reading of papers and for holding discussions upon Colonial and Indian subjects generally, and to undertake scientific, literary, and statistical investigations in connection with the British empire."

The Institute publishes a journal, which has already reached its twenty-eighth volume, the first four numbers of which have been bound. The character of its work may perhaps be illustrated by an enumeration of the principal papers contained in those recent numbers of the journal. Part I contains "Inter-British Trade," by Mr John Lowrie, and "The Colony of Victoria. Some of its Industries," by E. Jerome Dyer. Part II contains an article by Sir Henry H. Johnston, entitled "England's Work in Central Africa," in which the recent progress of civilization in Great Britain's share of that continent is admirably summarized. Mr

R. Murray Young has an article entitled "The Colonial Producer." Part III contains an article by Mr. Sidney Shippard on the Administration of Justice in South Africa, and one entitled "Cyprus and Its Possibilities" by Charles Christy. Part IV pictures the economic condition of Australia at the present time, under the title "Studies in Australia in 1900," by Hon. T. A. Henney.

H. G.

PROCEEDINGS OF THE NATIONAL GEOGRAPHIC SOCIETY, SESSION 1896-'97

Special Meeting, March 15, 1897.—Third Monday afternoon Illustrated Lecture. Vice-President Greeley in the chair. Rev. Thomas J. Shahan, S. L. O., Professor in the Catholic University of America, lectured on Syria.

Regular Meeting, March 19, 1897.—Vice-President Merriam in the chair. Mr. Arthur P. Davis, of the U. S. Geological Survey, read a paper on "The Diversities of Southern Arkansas and How They Are Modified by Irrigation," illustrating the subject with lantern slides.

Special Meeting, March 22, 1897.—Fourth Monday afternoon Illustrated Lecture. President Hubbard in the chair. Prof. Thomas Davidson, M. A., of Aberdeen, Scotland, lectured on Tyre and Sidon.

Annual Reception, March 25, 1897.—The Annual Reception of the Society was held at the Arlington Hotel, from 9 to 12 o'clock p. m. President Hubbard, with the ladies of the Reception Committee, received the members and guests of the Society, to the number of 800. The Society was honored with the presence of the President of the United States and several members of the Cabinet.

Special Meeting, March 29, 1897.—President Hubbard in the chair. Hon. John W. Foster read a paper on the Hawaiian Islands. A number of maps were shown on the screen at the commencement of the lecture, and at its close Mr. E. D. Fenton, of the U. S. Coast and Geodetic Survey, exhibited a series of lantern-slide views of scenery in the Islands.

Electors.—New members have been elected as follows:

March 19.—D. Q. Abbot, Mrs. Emily E. Briggs, Paul Brockett, Rev. S. Bayard Ford, Prof. J. M. Drake, A. F. Dunnington, Miss C. L. Frerichs, Prof. H. G. Flippo, S. R. Laird, Col. J. H. Lewis, C. S. A., George K. Magrath, V. F. Minotaur, Miss Helen McNeilly, Miss Anna S. Pack, Dr. Fred L. Taber, Miss Olive R. Seward, J. C. Stanton, C. E.

At a meeting of the Royal Geographical Society held in London on March 22 Dr. Nansen expressed his conviction that a properly equipped expedition could not reach the Pole in a single summer. He stated, however, that from a scientific point of view the results of such an expedition would be of far less value than those of some other explorations that might be undertaken in the less known parts of the Arctic region.

"FROM FROST TO FLOWERS."

"The Chariot . . .

. . . of the Sun"

SUNSET LIMITED is the Southern Pacific's great train, running through and from New Orleans to the Pacific Coast.

SUNSET LIMITED leaves New Orleans every Monday and Thursday at ten o'clock in the morning.

SUNSET LIMITED covers the 900 miles to Los Angeles in 58 hours, and the 480 to San Francisco in 48 hours.

SUNSET LIMITED is ventilated throughout, steam heated and gas lighted.

SUNSET LIMITED has a ladies' parlor the full width and a third the length of a car, equipped with fine library, excitation and writing materials, large easy chairs, etc.

SUNSET LIMITED has an equally commodious smoking and reading room for gentlemen, supplied to a similar manner.

SUNSET LIMITED has bath room, barber shop and buffet—Dainties the tourist will appreciate.

SUNSET LIMITED has a car containing seven drawing rooms, which can be used separately or en masse, each having private lavatory and toilet facilities.

SUNSET LIMITED has a sumptuous dining car, which goes through with it and in which meals are served à la carte.

SUNSET LIMITED is accompanied by a maid whose services are at the disposal of lady passengers.

SUNSET LIMITED traverses a road where snow never falls and blockades and blizzards are unknown, and through a region of marvelous interest.

SUNSET LIMITED is at your service, and any Southern Pacific Agent will be glad to tell you all about it, or if you want to know more, send 10 cents in stamps to the General Passenger Agent, and a beautiful book of 208 pages, that will tell you all about the route and the road.

S. F. B. MORSE,

General Passenger and Ticket Agent,

NEW ORLEANS.

Among the Contents of Forthcoming
Numbers of

THE NATIONAL GEOGRAPHIC MAGAZINE

WILL BE THE FOLLOWING:

A Winter Voyage through the Straits of Magellan,

By ADMIRAL R. W. McLADE, U. S. N.,

The Deserts and Forests of Arizona,

By PROF. W. E. PERNOW, PH. D.,

Chief of the Division of Geology, U. S. Department of Agriculture.

Costa Rica,

By GENERAL RICHARD VILLAFRANCA,

Consul-General of Costa Rica at San José, Chairman, Ex-Commission
to the World's Columbian Exposition;

Prehistoric Man the Product of Geographic
Environment,

By HON. GARDNER G. HUBBARD LL.D.,

President of the National Geographic Society,

— AND —

Down the Volga, from Nijni Novgorod to Kazan,

By PROF. FREDERIC W. TAYLOR.